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Attorney Reference Number 3382-59150-01
Application Number 09/323,767

Claims

Claims:

1. (Currently amended) A computer-implemented method comprising:
receiving a signal indicative of an occurrence of an ECN event caused by congestion within a channel in a network communication link comprising an aggregate of a plurality of related channels connecting a source to a destination via the network communication link, wherein the signal indicating the ECN event is detectable in the source, the destination and the network; and
based on the signal indicating the ECN event occurrence, selecting, according to a congestion pricing criteria, at least one channel of the aggregate of the plurality of related channels to have decreased packets transmitted therethrough for alleviating the congestion; and decreasing the packets transmitted on the at least one selected channel by modifying filters and queues of the at least one selected channel.
2. (Canceled)
3. (Previously presented) The method of claim 1, wherein the network comprises the Internet, and the source comprises an IP protocol layer.
4. (Canceled)
5. (Previously presented) The method of claim 1, wherein receiving the signal indicative of the ECN event occurrence comprises receiving the signal at one of the source and the network.
6. (Previously presented) The method of claim 1, wherein selecting the at least one channel to have decreased packets transmitted therethrough comprises selecting the at least one channel at one of the source and the network.

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7. (Previously presented) The method of claim 1, wherein receiving the signal indicative of the ECN event occurrence comprises receiving the signal at a layer higher than a source protocol layer and selecting the at least one channel to have decreased packets transmitted therethrough comprises selecting the at least one channel at the layer higher than the source protocol layer.

8. (Previously presented) The method of claim 1, wherein receiving the signal indicative of the ECN event occurrence comprises receiving the signal at a computer program at the source and selecting the at least one channel to have decreased packets transmitted therethrough is implemented by the computer program at the source.

9. (Previously presented) The method of claim 1, wherein receiving the signal indicative of the ECN event occurrence comprises receiving the signal at the destination at which the packet transmitted is received, and selecting the at least one channel to have decreased packets transmitted therethrough comprises selecting the at least one channel at the destination.

10. (Previously presented) The method of claim 1, wherein receiving the signal indicative of the ECN event occurrence comprises receiving a packet sent by a destination protocol layer of the destination indicating the ECN event at the source.

11. (Previously presented) The method of claim 10, wherein selecting the at least one channel to have decreased packets transmitted therethrough comprises selecting the at least one channel at the source.

12. (Currently Amended). A computerized system comprising:

a network layer having a network communications link comprising an aggregate of a plurality of related channels therethrough, and triggering an ECN event in response to congestion within one of the aggregate of related plurality of channels during transmission of a packet from a source having a source protocol layer to a destination having a destination protocol layer, wherein the triggered ECN event is detectable at the source, and the destination; and,

a policy mechanism to select, according to a congestion pricing criteria, at least one channel of the aggregate of related plurality of channels other than the congested channel to have

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decreased transmission of packets therethrough based on the ECN event for alleviating the congestion and, decreasing the packets transmitted on the at least one selected channel by modifying filters and queues of the at least one selected channel.

13. (Original) The system of claim 12, wherein the network layer comprises the Internet.

14. (Original) The system of claim 12, wherein at least one of the source protocol layer and the destination protocol layer comprises an IP layer.

15. (Previously presented) The system of claim 12, wherein the policy mechanism resides at the network layer.

16. (Original) The system of claim 12, wherein the policy mechanism resides at the source.

17. (Canceled)

18. (Previously presented) The system of claim 16, wherein the destination is to send the source a packet indicating the ECN event so that the source detects the occurrence of the ECN event.

19. (Previously presented) The system of claim 16, wherein one of the destination and the network layer is to indicate to the source that the ECN event has been triggered via a source layer higher than the source protocol layer.

20. (Original) The system of claim 12, wherein the policy mechanism resides at the destination.

21. (Original) The system of claim 20, wherein the destination is to communicate to the source the at least one channel to have decreased transmission of packets therethrough.

22. (Canceled)

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23. (Original) The system of claim 12, wherein the ECN event is based on a congestion pricing criteria.

24. (Previously presented) A computer comprising:

a processor;

a computer-readable medium;

a protocol layer having a network communications link comprising an aggregate of related plurality of channels connecting a source to a destination via the network communications link, the aggregate of related plurality of channels including a congested channel; and

a congestion policy program executed by the processor from the medium, wherein the congestion policy program is responsive to an ECN event triggered within the congested channel due to a congestion during transmission of packets from the source to the destination and, wherein the ECN event is detectable within the source and the destination, for selecting, according to a congestion pricing criteria, at least one channel of the aggregate of related channels other than the congested channel to have decreased transmission of packets therethrough based on the ECN event triggered within the congested channel to alleviate the congestion and, the congestion policy program being further operative for decreasing the packets transmitted on the at least one selected channel by modifying filters and queues of the at least one selected channel.

25. (Original) The computer of claim 24, wherein the protocol layer comprises a source protocol layer.

26. (Original) The computer of claim 24, wherein the protocol layer comprises a destination protocol layer.

27. (Canceled)

28. (Canceled)

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29. (Currently Amended) A machine-readable medium having processor instructions stored thereon for execution by a processor, the medium causing performance of a method comprising:
receiving feedback of an ECN event triggered due to a congestion occurrence in one of an aggregate of related plurality of channels within a network communications link connecting a source protocol layer to a destination protocol layer, wherein the feedback is detectable at the source and the destination; and

selecting, according to a congestion pricing criteria, at least one channel of the aggregate of related plurality of channels to have decreased packets transmitted therethrough, based on the ECN event for alleviating the congestion and:

decreasing the packets transmitted on the at least one selected channel by modifying filters and queues of the at least one selected channel.

30. (Canceled)

31. (Original) The medium of claim 29, wherein the network comprises the Internet, and the source protocol layer comprises an IP protocol layer.

32. (Canceled)

33. (Previously presented) The medium of claim 29, wherein selecting the at least one channel to have decreased packets transmitted therethrough comprises selecting the at least one channel at one of the source and the network.

34. (Previously presented) The medium of claim 29, wherein receiving feedback of the ECN event comprises receiving feedback at a layer higher than the source protocol layer and selecting the at least one channel to have decreased packets transmitted therethrough comprises selecting the at least one channel at the layer higher than the source protocol layer.

35. (Previously presented) The medium of claim 29, wherein receiving feedback of the ECN event comprises receiving feedback at a computer program at the source and selecting the

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at least one channel to have decreased packets transmitted therethrough is implemented by the computer program at the source.

36. (Previously presented) The medium of claim 29, wherein receiving feedback of the ECN event comprises receiving feedback at the destination at which the packet transmitted is received, and selecting the at least one channel to have decreased packets transmitted therethrough comprises selecting the at least one channel at the destination.

37. (Previously presented) The medium of claim 29, wherein receiving feedback of the ECN event comprises receiving a packet sent by the destination protocol layer of the destination indicating the ECN event at the source.

38. (Previously presented) The medium of claim 37, wherein selecting the at least one channel to have decreased packets transmitted therethrough comprises selecting the at least one channel at the source.

39. (Previously presented) The medium of claim 29, wherein selecting the at least one channel to have decreased packets transmitted therethrough comprises selecting the at least one channel at a layer higher than the source protocol layer.

40. (Previously presented) The medium of claim 29, wherein selecting the at least one channel to have decreased packets transmitted therethrough comprises selecting the at least one channel at a layer higher than the destination protocol layer receiving the packet sent by the source protocol layer.

41. (Currently Amended) A computer comprising:
a source protocol layer;
a plurality of filters;
a network communication link comprising an aggregate of related plurality of channels connecting a source protocol layer to a destination protocol layer in a network layer, each channel of the plurality of related channels associated with a filter; and

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a policy mechanism, responsive to an ECN event triggered due to a congestion during transmission of packets from the source protocol layer to the destination protocol layer via the network layer, wherein the ECN event is detectable within the source protocol layer and the destination protocol layer, the policy mechanism operative for selecting, based on the ECN event and a congestion pricing criteria, at least one channel of the aggregate of related plurality of channels to have decreased packets transmitted therethrough from the source protocol layer through the plurality of filters to alleviate the congestion and, the policy mechanism being further operative for decreasing the packets transmitted on the at least one selected channel by modifying the filters and queues associated with the at least one selected channel.

42. (Canceled)

43. (Previously presented) The computer of claim 41, further comprising at least one queue, each queue associated with one of the filters.

44. (Previously presented) The method of claim 1, wherein the aggregate of related channels comprises a video channel and an audio channel.

45. (Previously presented) The system of claim 12, wherein the aggregate of related channels comprises a video channel and an audio channel.

46. (Previously presented) The computer of claim 24, wherein the aggregate of related channels comprises a video channel and an audio channel.

47. (Previously presented) The medium of claim 29, wherein the aggregate of related channels comprises a video channel and an audio channel.

48. (Previously presented) The computer of claim 41, wherein the aggregate of related channels comprises a video channel and an audio channel.

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49. (Currently Amended) A computer-implemented method for alleviating congestion in a network communication link, the link comprising an aggregate of a plurality of related channels connecting a source to a destination via the network communication link, the method comprising:

receiving a signal indicative of an occurrence of an ECN event caused by congestion within a channel in the network communication link, wherein the signal indicating the ECN event is detectable at the source, the destination and the network; and

based on the signal indicating the ECN event occurrence, selecting, according to a cost associated with the congestion, at least one channel other than the congested channel from the aggregate of the plurality of related channels, to have decreased packets transmitted therethrough for alleviating the congestion in the congested channel and:

decreasing the packets transmitted on the at least one selected channel by modifying filters and queues of the at least one selected channel.